

© The following paper is protected by copyright law.
It has not been reviewed for accuracy or quality, and the posting of it
to the ERS website does not constitute endorsement by ERS.

Changes and Trends in Consumption Patterns

Ben Senauer
Department of Applied Economics
University of Minnesota
St. Paul, MN

CHANGES AND TRENDS IN CONSUMPTION PATTERNS

In his Presidential Address to the American Agricultural Economics Association, John Antle (1999) addressed “The New Economics of Agriculture”. In the “old” (or traditional) economics of agriculture the focus was on quantity demand. Antle argued that the “new economics” is more concerned with the markets for quality-differentiated products. He presented a stylized demand function (Antle, 1999, p. 994):

$$(1) \quad X = D(\mathbf{P}, I, N, \mathbf{C}, \mathbf{Q})$$

where demand (X) depends on the price of that product and other goods (\mathbf{P}), income (I), population (N), characteristics of the population (\mathbf{C}), and nonprice attributes of the produced (\mathbf{Q}).

The quality factors can include any attributes of the product from which consumers derive utility or disutility. They may include nutritional content, safety and convenience characteristics and might also include how the product was produced, the environmental impact of production, and production processes and inputs like pesticides, irradiation and genetically modified organisms (Antle, 1999). Demand analysis in the “old economics” concentrated on the impact of prices and income on quantity demand. In the “new economics”, demand analysts need to give much more attention to understanding the effect of consumer characteristics (\mathbf{C}) and quality attributes (\mathbf{Q}) on food demand and consumption.

THE DEMAND FOR QUALITY ATTRIBUTES

The income elasticity of demand for quantity, in terms of basic agricultural commodities, is low. The income elasticity for many quality characteristics is substantially higher. As incomes have grown, demand has shifted toward high-quality, processed and prepared foods that provide convenience and other desired attributes. Domestic agricultural commodity demand has grown only slowly or been stagnate (Antle, 1999).

.

The development of the food processing and retailing industries reflects a response to this demand for quality-differentiated products, as does the “industrialization of agriculture” to some extent (Antle, 1999). The basic commodity is only one input to a multi-stage process that adds much more value to the quality-differentiated product after it leaves the farm. Quality-differentiated products necessitate coordination between the different stages of the production process, but do not necessarily require ownership or concentration. There may be economies of size, but there are also opportunities for small specialized enterprises to fill the specific quality preferences of some consumer segments or niches.

Table 1 provides stylized income elasticities of demand for various food attributes. An income elasticity shows the change in demand as income increases. Calories, in some respect, represent a basic measure of quantity. The demand for additional calories is close to zero in the United States and negative for many consumers who are trying to reduce their caloric intake, hence the abundance of reduced calorie products on the market. The income elasticity is also negative

among many consumers for food components, such as fat and cholesterol, which have been shown to have a detrimental impact on health. In the 1999 Parade Magazine “What America Eats Survey”, 42 % said low fat was either an extremely or very important factor in their food choices (Parade, 1999). However, for the aggregate population, the demand for fat is still positive since U.S. per capita consumption of fats and oils rose 25 % between 1970-1997 (Putnam and Allshouse, 1999, p. 32). On the other hand, the nutritional/health value of food has become more important. The demand for nutrients, such as calcium, that are important to good health is high, at least for many people; hence the availability of calcium-fortified products, such as orange juice and milk. In the Parade survey, 69 % said nutritional/health value was either extremely or very important in their food choices (Parade, 1999, p. 6).

One of the food attributes for which demand is high is convenience, which will be discussed in detail later. Fifty-five percent said it was either extremely or very important in the Parade survey. At higher income levels, people want diets that are more diverse and varied and become more concerned about food safety. Because the demand for food safety rises, even though the safety of the U.S. food supply is higher than ever before, it may appear at times as if the demand for safety is not being met. At higher income levels, many consumers become concerned about whether production is environmentally benign (the term green is widely used in Europe) and sustainable. Naturalness may also be an important attribute for some. They want food that is a product of “Mother Nature”, not technology.

Taste remains the single most important food attribute. In the Parade survey (1999, p. 6), taste

was the most important criteria affecting food choices; for 97 % of respondents it was either extremely or very important. For the women surveyed, 88 % indicated that taste is the main reason for buying the same brand and for 72 % taste is a major reason for switching brands (Parade, 1999, p. 34). Moreover, increasing numbers of people can afford to pay for foods and meals that provide unique sensory experiences, such as served at gourmet restaurants. Food can also be used as a means of attempting to gain status, which is really nothing new, but is now affordable for more of the population. The concept of value relates the quality to the price. People with lower incomes are very price conscious, but virtually everyone wants to feel they are getting good value for the money they spend. In the same Parade survey, 74 % indicated cost/price was either extremely or very important and 73 % said it was the major factor behind switching brands (Parade, 1999).

POPULATION CHANGES AND THEIR IMPLICATIONS FOR QUALITY DEMAND

Fundamental changes in the characteristics of the American population, C in eq. 1, are having a major impact on the quality attributes demanded, Q in eq. 1. The most important of these population changes fall into the following major areas: the increased participation of women in the workforce, the rising value of time and the demand for convenience; the increasing inequality in the distribution of income, the resulting economic haves and have-nots and the division into price-conscious and convenience/quality oriented consumers; and finally, the evolution of a multi-ethnic culture and other factors which have led to the replacement of the mass market with a segmented market.

Working Women, the Value of Time and the Demand for Convenience

When historians of the future look back at the last decades of the 20th Century in the United States, the dramatic increase in the labor force participation of women will almost certainly stand out as one of the most significant social and economic changes of this period. The labor force participation rate for women, which stood at 43.3 % in 1970, reached 59.8 % in 1998, with 61.4 % forecast for 2006 (U.S. Census Bureau, 1999). For women age 35-44, the rate climbed from 51.1 % in 1970 to 77.1 % in 1998, and a predicted 80.2 % in 2006. The rate for men age 35-44 is predicted to be only 10 percentage points higher at 90.7 % in 2006.

The most obvious and widespread impact of these changes is the rising pressure on time and the increasing demand for convenience in how we buy, prepare (if at all), and eat food. For many meal occasions what people want is a meal to eat not food to prepare. Fewer people eat the three traditional meals each day. There is more grazing or snacking, eating smaller amounts throughout the day. People combine eating with something else, like working at their desk or driving their car. A minority of households have a wife/mother who feels it is her responsibility, or if she does, has the time, to be the gatekeeper for food, the primary food shopper and cook, as was traditional in previous generations.

The household production model of Gary Becker, who won the Nobel Prize in Economics, can be used to enrich our understanding of the forces driving the demand for convenience. In the Becker (1965) model, the goods actually consumed that generate utility are produced through combining goods that are purchased with household time, and household and human capital.

What yields utility is the meal that is eaten after being cooked with the groceries that were purchased. Even getting a fast food meal, requires time to travel there and likely household capital in the form of an automobile is used for transportation. As incomes (wages and salaries) have risen over time, and especially as women have entered the workforce, the opportunity cost of time has increased. The rising value of time has driven the shift away from time-intensive consumption (home-cooked meals) and the demand for convenience.

The increasing value of time is the most important factor behind the steady rise in the portion of food expenditures which are classified as “away from” versus “at home”. The share of income spent for food at home fell from about 14 % in 1960 to only 6.6 % in 1997, whereas the share spent on food away from home rose from about 3.5 % in 1960 to 4.1% in 1997 (Putnam and Allshouse, 1999). At some time, perhaps in the next decade, the two will cross and more will be spent on food away than at home.

However, USDA’s breakdown into food at home and food away from home is no longer really adequate. Figure 1 provides a much more complete breakdown of eating occasions (McKinsey, 1996, p. 2). The upper numbers give the percent of eating occasions (based on expenditures) in each category in 1995 and the lower numbers (in parentheses) in 1985. The shifts are driven by the demand for convenience with growth in categories such as on-premise and off-premise consumed away from home. The largest drop was in prepared at home from basic ingredients, with a decline from 25 % to 21 %. In the area of fully prepared away from home and consumed at home, there is a shift from packaged to fresh products.

As of now, only a small proportion of people are using the internet and home delivery as a more convenient way to shop for food. There are predictions of robust future growth by some and a number of new companies are counting on such growth. A survey of 900 consumers by The Retail Food Industry Center, located at the University of Minnesota, found that in 1999 only 3.3 % of food shoppers had ever purchased food over the internet. Some 35.4 % said they would be either very likely or somewhat likely to do so in the future. Home delivery is actually a return to something quite traditional. In 1929 before supermarkets became the dominant grocery retail format, home delivery accounted for 13.8 % of food-at-home sales (The Food Institute, 1996).

Income Inequality: the Price Conscious and the Convenience/Quality Oriented

The gap between the economic “have’s” and the “have-not’s” has been growing in the United States. The Center on Budget and Policy Analysis using Congressional Budget Office data calculated that the share of all income received by the top quintile (20%) of households increased from 44.2 % in 1977 to 50.4 % in 1999, whereas the other four out of five households received a smaller piece of the economic pie in 1999. Moreover, the after-tax income, after adjusting for inflation of the lower three quintiles (60 % of households) was actually lower in 1999 than 1977 (Johnston, 1999).

The most fundamental segmentation of food consumption and shopping patterns is into those who are price conscious with lower incomes and the convenience/quality oriented with higher incomes. The original segmentation by the Food Marketing Institute put 45 % of food shoppers

in the price-conscious group and 55 % into the convenience oriented (Sansolo, 1996). In the recent consumer survey by The Retail Food Industry Center, a question was asked concerning the importance of 33 various factors in choosing a grocery store to shop at. Fifty-two percent could be identified as price conscious based on their ranking price as a more important factor than the median response for all 33 of the factors. The other 48 % who did not rank price higher than the median for all of the factors could be considered convenience/quality oriented.

Virtually all of us at this Conference are in the top quintile in terms of income, although we might not realize it or want to admit it, and are probably convenience/quality oriented food consumers. Just how differently lower- income people view food shopping was made apparent to me when I observed two focus groups last year. Each group was composed of about ten women. No men were included because it is better not to mix genders in terms of focus group dynamics. Of the twenty some women, all but one would clearly fall into the price conscious group. They felt very constrained by their budgets and saw the process of food shopping as a burden. These women all shopped at low-priced superwarehouse stores. Their families' food away from home spending was usually on fast food, that being all they felt they could afford.

The one exception in the focus groups was a women from an empty nest household with a higher income. She stood out from the others. She shopped at an upscale supermarket and said she actually enjoyed grocery shopping. The differentiation into the price conscious and the convenience/quality oriented creates perhaps the most important segmentation of the food market, but there are many other factors which also segment the market.

Ethnicity and Other Segmentation Factors

The United States has increasingly become a multi-ethnic society. The last two decades of the 20th Century saw the highest levels of immigration since the first two decades of the century. There were 7.3 million immigrants in the period 1981-1990 and 6.9 million in 1991-1997 compared to 8.8 million in 1901-1910 and 5.7 million in 1911-1920. Of course, at the beginning of the century these numbers represented a far larger proportion of the existing population (U.S. Census Bureau, 1999). Currently, Blacks compose 13 % of the population, Asians 4 % and Hispanics 11 %. By 2020, Blacks are predicted to account for 14 %, Asians 6 % and Hispanics over 16 %. Together they will represent over 36 % of the population and Hispanics will be the largest minority with a forecast of 53 million (U.S. Census Bureau, 1999).

The melting pot, in terms of rapid adoption of the dominant culture by immigrants, no longer operates as previously. Immigrants retain more of their own cultures and bring a richer cultural diversity to American society, that some have referred to as a tossed salad rather than a melting pot. The market for ethnic foods has grown rapidly. Moreover, there has been a marked impact on Americans' eating habits in general. Most Americans eat a far more ethnically diverse diet than previously. Most large cities contain a considerable array of authentic ethnic restaurants. There are a number of other demographic shifts leading to the breakdown of the mass market into segments. However, there is not time to discuss the others here.

BIOTECHNOLOGY AND GM FOOD PRODUCTS

The single quality-differentiation factor currently receiving the most attention is genetic modification. The difference in the consumer perception of biotechnology and genetically modified (GM) food products between Europe and the United States is dramatic. In general, Americans are much more accepting of biotechnology and GM products and Europeans much more mistrusting. There are few factors that will have a greater impact on agriculture and the food industry than how this difference is resolved. The consumer attitudes presented here are based on surveys of 1,067 American consumers and 16,246 European consumers, collected in the period 1995-1999 (Hoban, 1999).

For the years 1992 and 1997-1999, from 69-78 % of American consumers surveyed indicated they believed that biotechnology would benefit them or their families in the next five years (see Figure 2). Their support for agricultural biotechnology was 70 % or higher, although somewhat lower among women than men (see Figure 3). Support is stronger among those with more education (Hoban, 1999). In 1998, support was at 63 % by those with less than a high school education, 69 % by high school graduates and 80 % by college graduates. Around three-fourths of American consumers indicated a willingness to buy produce developed through biotechnology that provides protection from insects and 55-62 % if it tastes fresher/better, depending on the year (Hoban, 1999).

In contrast, a high proportion of Europeans see genetic engineering as a serious food risk. In 1995, 65 % of Swedish consumers felt genetic engineering posed a serious food risk, 57 % of

Germans, 48 % of the Dutch, 39 % of the British, 38 % of the French, and 30 % of the Italians, whereas only 21 % of the Americans did (see Figure 4). Europeans have a much lower perception of the potential benefits of biotechnology and genetic engineering than other new technologies, such as in telecommunications, computers or solar energy. Interestingly, they make a distinction between biotechnology and genetic engineering, with 51 % indicating the former will have a positive impact and only 40 % for the latter (Hoban, 1999).

Fifty-seven percent of Americans feel that biotechnology and genetic engineering will have a beneficial impact, but only 28 % of Austrians and 36 % of Germans do. However, 57 % of Italians do and 56 % of Spaniards do, which is as high as the Americans (see Figure 5). Only 43 % of Europeans feel biotechnology should be used to improve food and 44 % feel it should not (Hoban, 1999). The willingness to buy produce developed through biotechnology to resist insect damage was 73 % in the United States in 1995, 63 % in the United Kingdom, 60 % in France, 53 % in Italy, and only 30 % in Germany and 22 % in Austria (see Figure 6).

Some of the mistrust of biotechnology and genetic engineering may be based on a quite shocking level of ignorance. When asked to indicate whether it is true or false that “ordinary tomatoes do not contain genes while genetically modified ones do”, 10 % of the consumers surveyed in the USA agreed with this statement, 22 % in the United Kingdom, 21 % in Italy, 29 % in France and an astounding 44 % in Germany and Austria (see Figure 7). When asked to indicate whether the statement “by eating a genetically-modified fruit, a person’s genes could also be

changed”, 9 % of Americans indicated it was true, 15 % of the British, 18 % of the Italians, 23 % of the French, and an amazing 30 % of the Germans and 39 % of the Austrians (see Figure 8).

AN ANALYSIS OF ATTITUDES TOWARDS GM FOODS

In the model developed by Kelvin Lancaster (1966a and 1966b), consumers derive utility (U) from the attributes or characteristics (C's) which are embodied in the goods they purchase. Preferences relate to these attributes or characteristics.

$$(2) \quad U = f(C_1, \dots, C_n)$$

There is a “technology of consumption” which reflects the relationship between goods (X's) and attributes.

$$(3) \quad C_{ij} = a_{ij} X_j$$

where C_{ij} is the amount of the i th characteristic obtained by consuming the j th good, a_{ij} is the amount of the i th characteristic or attribute in a unit of the j th good, and X_j is the amount of the j th good consumed.

Lancaster thought of this relation between goods and attributes (the a_{ij} 's) as being objective. However, what actually affects consumer choice is their subjective perception of the technology. This model can be utilized to analyze the underlying explanations for the sharply different attitudes toward biotechnology and GM foods in Europe and the USA.

In the next figures (see Figure 9a), the vertical axis reflects benefits and the horizontal axis risks,

such as possible negative health and environmental impacts. Risk is a “bad” producing disutility, not a “good” attribute. Its measurement is reversed with more to the left and less to the right; less

risk can thus be treated as a “good”. The indifference curves are meant to reflect the typical American consumers’ preferences between benefits and less risk. The direction of the vector OA reflects the relative amounts of benefits and risks that are perceived to be embodied in the food product being considered. The length of the vector OA is determined by the budget allocated for the purchase of the product considered and its price, and hence the amount of benefits and risks yielded by the product if purchased.

At this point, most American consumers do not see much difference between GM food products, in terms of providing more benefits or having greater risks, and traditional (non-GM) foods. Therefore, the GM and non-GM vectors are the same. The consumer will buy whichever is less expensive or will not care if they are identified by label as GM or non-GM. For example, only a minority of consumers are willing to pay the premium for milk certified to come from cows not treated with rBGH (recombinant bovine growth hormone), when it is available. Those consumers who do purchase the certified milk can be presumed to do so because they perceive it to have fewer risks, and thus it yields more utility for them. In this case, the non-GM vector would be longer and reach a higher indifference curve than the GM product. Most Americans are content to purchase unlabeled milk, which may come from cows treated with rBGH.

Proponents of biotechnology argue, that if not now, there will be distinct health benefits from

GM foods in the future. In that event, Figure 9b would reflect the general perception of a GM food product yielding more benefits in relation to any risks, for the amount that can be purchased with a given allocation. As drawn, the figure shows a case in which the GM product has the same risk level as the non-GM food, but is perceived to have additional benefits. Consumers would get more utility from the GM food and would be willing to pay a premium for it.

Figure 10 reflects the situation of European consumers who perceive that GM products have no additional benefits, but are riskier for their health and/or the environment. Therefore, the GM product yields less utility and is avoided. There are opponents of biotechnology that would like to convince American consumers generally that this European perception of the riskiness of GM foods is correct. The proponents of biotechnology see European consumers as misinformed and hope to change their perception of the technology to match that in the USA (shown in Figure 9a), that GM is no riskier than non-GM, or even that in Figure 9b as GM foods with specific health benefits are introduced.

Figures 11a and 11b reflect a situation in which the perception of the technology is similar in the USA and Europe. However, the underlying preferences may be different. Europeans are depicted

has having a greater preference for naturalness and tradition as food attributes. One of the complaints against genetic modification is that it is seen as “tampering with Mother Nature”. As modern work and life have become increasingly technological, for some people the naturalness

of food may have become more important. Moreover, Europe has a rich heritage of food traditions. Speciality foods such as Parma ham or parmigiano reggino cheese have a provenance (origin) and are produced according to long-standing traditions, which are closely regulated.

In Figure 11a, the typical American consumer gains greater utility from purchasing the GM product. In contrast in Figure 11b, the typical European consumer, even though his/her perception of the technology is similar (OAB is the same in both graphs), obtains more utility from the non-GM product because of their greater preference for naturalness and tradition. If there are such fundamental differences in underlying consumer preferences, then more information and education about the technology may not alter Europeans' negative attitude towards genetic modification.

Moreover, European consumers may be more risk adverse because of recent major food safety incidents. Mad cow disease has had a major impact in Europe, as the evidence has mounted that it can be transmitted to humans. The French are still refusing to import British beef because of it. In addition, there are a number of other recent food safety incidents, such as poultry that was found to contain dioxin because of contaminated feed in Belgium. Europeans may also have less belief that government action will protect them from food safety risk. The British government downplayed the risk of mad cow disease to humans for a long time. There is no pan-European equivalent to the U.S. Food and Drug Administration (FDA) to provide effective food safety regulation. If Figures 11a and 11b were cast in terms of benefits and risks as the previous figures were, the indifference curves could be left unchanged to reflect Europeans' greater risk

adverseness. The end result would be the same, Americans would purchase the GM product and the Europeans the non-GM, because of an underlying difference in preferences.

NATURAL/ORGANIC PRODUCTS

The rapidly growing market for natural/organic products provides one of the best examples of the opportunities provided by quality differentiation. Natural food sales totaled \$8.3 billion in 1998, up 8 % from 1997. Organic sales were \$ 3.5 billion, up 14 %, while conventional-food sales grew only about 2 % (Supermarket News, 1999). There are predictions that natural food sales will reach \$60 billion by 2008 and account for 10 % of the total retail food market (The Retail Food Industry Center, 1999). The USDA is to be complemented on the revised organic food regulations proposed recently. They will provide clear nationwide standards for organic products. The new tougher rules will prohibit the use of GM ingredients in products labeled organic. Therefore, consumers who are concerned about genetic modification will have a clear choice. In addition, the rules should help resolve trade issues with Europe over genetic modification. The Europeans would be able to import certified organic products from the U.S., which would be free of genetic modification (Kaufman, 1999).

IMPLICATIONS FOR FOOD SYSTEM STRUCTURE

My concluding comments will suggest a few of the implications of these consumer trends for the structure of the food system. Perhaps the most significant impact will be to divide business enterprises in the food system from farmers, to processors, to retailers into those that focus on a

low-cost strategy to meet the demand of the price-conscious market segment and those that follow a quality-differentiation strategy to satisfy the convenience/quality oriented segment (Porter, 1980 and Brester and Penn, 1999). There will also be increasing opportunities to pursue a focused strategy to meet the demand of particular market segments for products that embody specific attributes, such as the rapidly growing Hispanic market or the fast growing market for organic products. Many of the best chances for smaller business operations will be with a focused strategy. Competition will either be on the basis of price, quality differentiation, or product attribute specialization. Brester and Penn (1999) predict in their assessment of agribusiness strategies that a “middle of the road” approach will be the worst strategy. All three strategies, but especially a quality differentiation strategy, may require greater coordination by firms linked together in the supply chain

REFERENCES

- Antle, John M., 1999. "The New Economics of Agriculture", **American Journal of Agriculture Economics**, 81: 993-1010.
- Becker, Gary S., 1965. "A Theory of the Allocation of Time", **Economic Journal**, 75: 493-517.
- Brester, Gary W. and J. B. Penn, 1999. "Strategic Business Management Principles for the Agricultural Production Sector in a Changing Global Food System", Policy Issues Paper No. 11, Trade Research Center, Montana State University, Bozeman, MT, Nov. 1999.
- Hoban, Thomas, J., 1999. "Understanding and Effectively Communicating with Consumers in a Biotech-World", mimeos of overhead graphs, Dept. of Sociology and Food Science, North Carolina State University, Raleigh, NC.
- Food Institute, The, 1996. "Doorbells Ring for Food Sales", **The Food Institute Report**, Dec.16, 1996, p.1.
- Johnston, David Cay, 1999. "Gap Between Rich and Poor Found Substantially Wider", **The New York Times**, Sept. 5, 1999, p. 14.
- Kaufman, Marc, 1999. "Tighter Rules for Organic Food Eyed", **The Washington Post**, March 4, 2000, p. A1.
- Lancaster, K. J., 1966a. "A New Approach to Consumer Theory", **Journal of Political**

Economy, 74:132-157.

Lancaster, K. J., 1966b. "Change and Innovation in the Technology of Consumption",

American

Economic Review, 56:14-23.

McKinsey and Company, 1996. **Foodservice 2005: Satisfying America's Changing Appetite**, International Foodservice Distributors Assoc. and Food Distributors International, Washington, D.C.

Parade Magazine, 1999. **What America Eats, 1999/2000**, Vol. 7.

Porter, Michael E., 1980. **Competitive Strategy**, New York: Free Press.

Putnam, Judith P. and Jane E. Allshouse, 1999. **Food Consumption, Prices and Expenditures, 1970-1997**, USDA, ERS, Statistical Bulletin No. 965, Washington, DC.

Sansolo, Michael, 1996. "The State of the Food Marketing Industry: Speaks 96", presented at the Food Marketing Annual Supermarket Convention, Chicago, May 6, 1996.

Supermarket News, 1999. "Natural-Food Sales Outlook Promising Continued Growth", July, 19, 1999, p. 28.

Retail Food Industry Center, The, 1999. "Conventional and natural Foods, an Uneasy Market Marriage", **TRFIC Newsletter**, Vol. 5, No. 3, Fall 1999, p. 1.

U.S. Census Bureau, 1999. **Statistical Abstract of the United States**, Washington D.C.

